

Florida Department of Environmental Protection



Office of Ecosystem Projects

Water Conservation Area 1 Annual Total Phosphorus Criteria Compliance Assessment – WY 2014

Everglades Technical Oversight Committee
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Paul Julian II





Everglades Phosphorus Criterion: Impacted Station Assessment

62-302.540 (4)(d)2 F.A.C. states:

“...individual stations in the network shall be deemed to be unimpacted for purposes of this rule if the five-year geometric mean is less than or equal to 10 ppb (µg/L) ...”

Long term (i.e. 5 Year) geometric mean total phosphorus (expressed as µg/L) for impacted stations within the Refuge by Florida Water Year (May 1 – April 30).

Station	2005 - 2009	2006 - 2010	2007 - 2011	2008 - 2012	2009 - 2013	2010 - 2014
LOXA101						
LOXA105				13	14	15
LOXA124				12	12	12
LOXA130				11	10	10
LOXA137				11	11	10
LOXA140						
X1						29
Z1				35	26	27



Everglades Phosphorus Criterion: Impacted Station Assessment

62-302.540 (4)(d)2 F.A.C. states:

“...and the annual geometric mean is less than or equal to 15 ppb($\mu\text{g/L}$).”

Annual geometric mean total phosphorus (expressed as $\mu\text{g/L}$) for impacted stations within the Refuge by Florida Water Year (May 1 – April 30). All data were screened consistent with the TP rule methodology.

Station	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
LOXA101	19	15		14	10	13	11		18	14
LOXA105	38	15		15	11	12	13	17	17	17
LOXA124	30	11		13	13	12	10	11	12	13
LOXA130	27	15		11	10	10	10	13	9	8
LOXA137	23	14		9	10	11	11	15	10	9
LOXA140	18	12		8	8	11	9		10	8
X1				47		34	27	38	27	26
Z1				96	21	26	33	49	18	23



Water Quality Standards for Phosphorus Within the Everglades Protection Area (62-302.540 F.A.C.)

Achievement of the criterion for the ambient monitoring network is evaluated based on data collected monthly from stations in both impacted and unimpacted areas within the WCAs. This presentation focuses on compliance assessment within Water Conservation Area-1

To achieve the criterion, the following four provisions must be met within each network (impacted and unimpacted):

1. The five year geometric mean averaged across all stations is less than or equal to 10 $\mu\text{g/L}$.
2. The annual geometric mean averaged across all stations is less than or equal to 10 $\mu\text{g/L}$ for three of five water years.
3. The annual geometric mean averaged across all stations is less than or equal to 11 $\mu\text{g/L}$; and
4. The annual geometric mean at all individual stations is less than or equal to 15 $\mu\text{g/L}$.



TP Rule: Part 1

1. The water body will have achieved the criterion if the five year (WY2010-WY2014) geometric mean averaged across all stations is less than or equal to 10 $\mu\text{g/L}$.

Assessment results:

- Unimpacted: 8 $\mu\text{g/L}$ (Passed)
- Impacted: 18 $\mu\text{g/L}$ (Failed)



TP Rule: Part 2

2. The annual geometric mean averaged across all stations is less than or equal to 10 $\mu\text{g/L}$ for three of five water years.

Assessment results:

Water Year (May 1 - April 30)	Total Phosphorus ($\mu\text{g/L}$)	
	Unimpacted	Impacted
2010	8	16
2011	7	15
2012	8	24
2013	7	16
2014	7	16

<i>Status</i>	<i>Pass</i>	<i>Fail</i>
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* Values may differ slightly from previous years due to recent re-evaluation of impacted stations.



TP Rule: Part 3

3. The annual (WY2014) geometric mean averaged across all stations is less than or equal to 11 $\mu\text{g/L}$.

Assessment status:

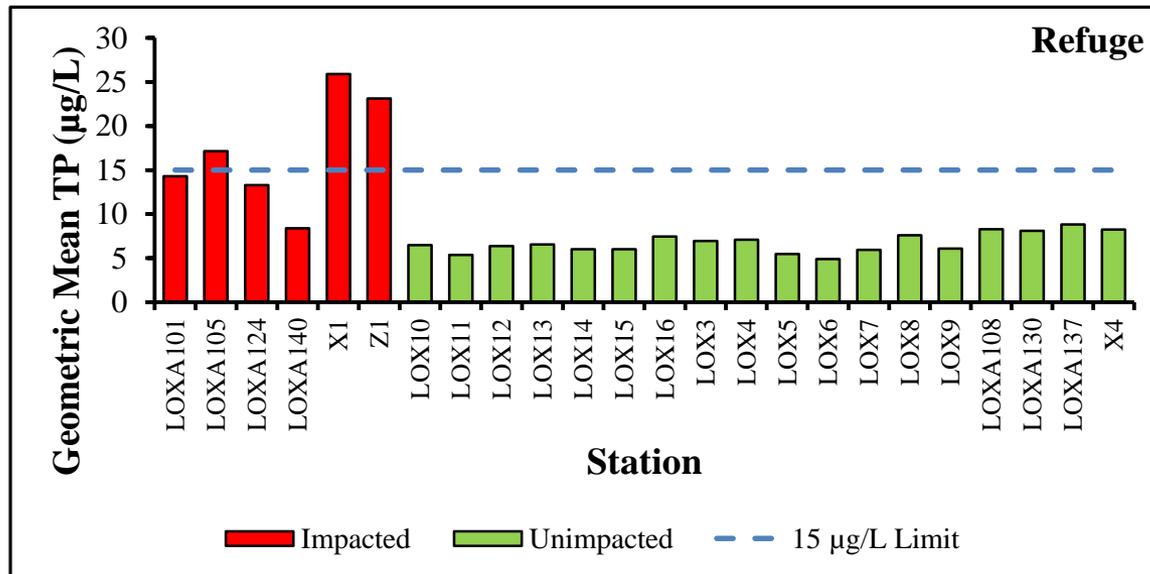
- Unimpacted: 7 $\mu\text{g/L}$ (Passed)
- Impacted: 18 $\mu\text{g/L}$ (Failed)

TP Rule: Part 4

4. The annual (WY2013) geometric mean at all individual stations is less than or equal to 15 $\mu\text{g/L}$.

Assessment results:

- Unimpacted: Passed
- Impacted: Failed (LOXA105, X1 and Z1)



* Stations with less than six samples.



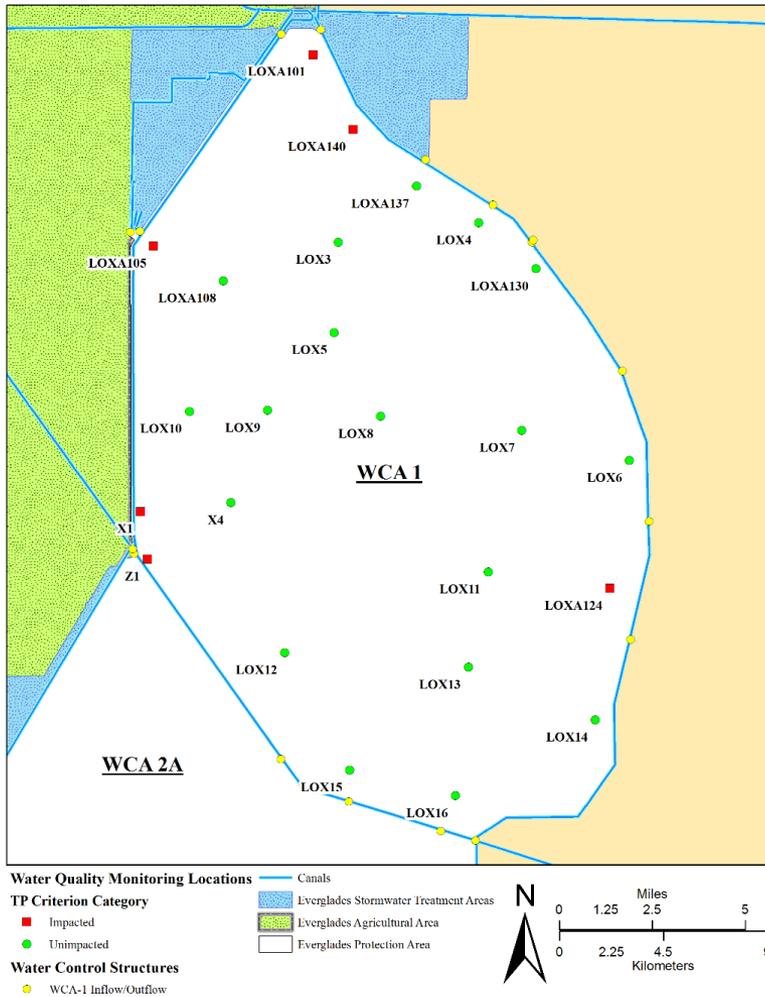
Summary

Phosphorus Rule* Compliance for WCA-1 (WY2010-2014)

Part	Description	Unimpacted		Impacted	
		Actual Value (µg/L)	Passed?	Actual Value (µg/L)	Passed?
1	5-yr geometric mean TP averaged across all stations is less than 10 µg/L	8	Yes	18	No
2	Annual geometric mean TP averaged across all stations is less than 10 µg/L for 3 of 5 years	8, 7, 8, 7 and 7 (2010-2014 respectively)	Yes	16, 15, 24, 16 and 16 (2010-2014 respectively)	No
3	Annual geometric mean TP averaged across all stations is less than or equal to 11 µg/L	7	Yes	16	No
4	Annual geometric mean TP at all individual stations is less than or equal to 15 µg/L	See previous slide. (All below 15 µg/L)	Yes	See previous slide. (LOXA105, X1 and Z1)	No

*F.A.C. 62-302.540 Water Quality Standards for Phosphorus Within the Everglades Protection Area

Supplemental Information – Sampling Locations within Water Conservation Area -1



Note: Station LOXA130 and LOXA137 transitioned from the impacted to unimpacted network for WY 2010 – WY2014 assessment.

Figure 1. Total phosphorus (TP) criterion assessment network stations within the Water Conservation Area-1. Sites identified were used in the Water Year 2010 – 2014 (WY2010-WY2014; May 1, 2009 – April 30, 2014) evaluation.

Supplemental Information – Network Trends

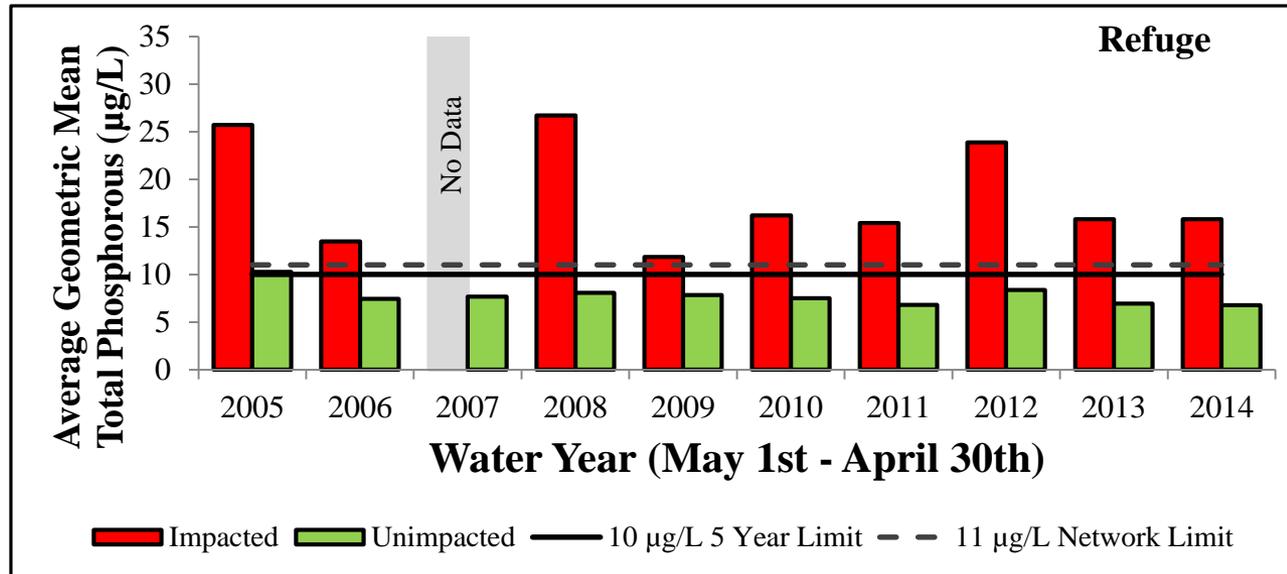


Figure 2. Network (Impacted and Unimpacted) trends for the Refuge from WY2005 to WY2014 relative to the 10 µg/L long-term (5 Year) and the 11 µg/L network limits.*Due to extreme weather events and drought conditions a data gap exists for WY2007 within the Refuge.